

## **REMARKS**

In view of the above amendments and the following remarks, reconsideration of the rejections and further examination are requested. Upon entry of this amendment, claims 39 and 42-64 are amended, claims 65-77 are cancelled, and claims 78 and 79 are added, leaving claims 39-64, 78 and 79 pending with claim 39 being independent. No new matter has been added.

Applicants submit that the claims have been amended to make them more clear and not to overcome the cited prior art.

### ***Rejections Under 35 U.S.C. §112, second paragraph***

Claim 62 has been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically, the Examiner states that the phrase “preferably” renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention.

Claim 62 has been amended to overcome this rejection.

### ***Rejections Under 35 U.S.C. §102(b)***

Claims 39-42, 44-47, 49, 55 and 58 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Jarrett et al. (US 4,737,247).

Applicants respectfully traverse this rejection and submit that the claims as currently pending overcome this rejection. In particular, claim 39 recites a method for electrolytic production of aluminium metal from an electrolyte comprising aluminium oxide, the method comprising controlling and maintaining the temperature of electrodes at a level different from the level of surrounding electrolyte by active or passive cooling and/or active and passive heating.

As recited in claim 39 of the present invention, the electronic active surface of the electrodes is actively controlled with regard to the temperature thereof to avoid:

- 1) dissolution of the electrodes (anode), and
- 2) deposit formation on the electrodes (cathode).

Thus, the present invention, as recited in claim 39, controls the temperature of the surface of the electrodes. One reduction in the surface temperature of the anode will result in a lower

dissolution rate. It is important to avoid a frozen layer on the cathode and the anodes, since this will reduce the active area of the electrode, which will have a negative impact on the electrolysis process. Therefore, as recited in the claims of the present invention, the temperature of the surface of the electrodes is controlled such that a freezing layer does not result on this surface.

The cited prior art fails to disclose or render obvious such a method. In particular, Jarrett discloses an inert electrically nonconductive material for spaces in inert anode-inert cathode assemblies. Additionally, in Jarrett a spacer is provided having a hollow cavity through which a heat pipe coolant, such as potassium or sodium, is passed to freeze a protective layer of bath around the spacer. A layer of frozen bath formed around the spacer protects the inert anode-inert cathode assembly from attack by the corrosive fluoride-containing molten salt bath of the cell. Thus, in Jarrett a protective layer is frozen onto the spacer assembly, and such a frozen layer is unwanted on the active surfaces of the electrodes, since, as discussed above, the frozen layer will have a negative influence on the reduction process.

Therefore, Applicants submit that the cited prior art fails to disclose each of the elements recited in independent claim 39. Moreover, there is no reasoning in the prior art to modify Jarrett such that it would have rendered claim 39 obvious. Therefore, Applicants submit that independent claim 39 and its dependent claims are allowable over the cited prior art.

#### ***Rejections Under 35 U.S.C. §103(a)***

Claims 48, 50-54, 57, 59-60 and 62-64 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Jarrett, as applied to claim 46 above.

Applicants submit that since each of these claims is dependent from claim 39, they are allowable for the reasons set forth above.

Claims 43, 56 and 61 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Jarrett, as applied to claim 42 above, in view of Brown (US 4,678,548).

Applicants submit that each of these claims is allowable for the reasons similar to those set forth above. That is, Brown, similarly to Jarrett, discloses spacers in inert anode-inert cathode assemblies for electrolyzing alumina dissolved in Hall bath. A spacer having a hollow cavity through which a coolant, such as nitrogen gas, is passed to freeze the protective layer of bath around the spacer. The heat transfer area inside the spacer is packed with a fine wire or fiber

having high absorptive surface to facilitate heat transfer by radiation. A layer of frozen bath forming around the spacer protects the inert anode-inert cathode assembly from attack by the corrosive fluoride-containing molten salt bath of the cell.

Thus, Brown fails to overcome the deficiencies of Jarrett discussed above, since in Brown a protective layer is frozen onto the spacer assembly.

Therefore, Applicants submit that independent claim 39 and its dependent claims are allowable over the cited prior art.

### ***Conclusion***

In view of the foregoing amendments and remarks, all of the claims now pending in this application are believed to be in condition for allowance. Reconsideration and favorable action are respectfully solicited.

Should the Examiner believe there are any remaining issues that must be resolved before this application can be allowed, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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/Jeffrey J. Howell/

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